

IN THE CLAIMS:

Please amend the claims as follows:

1 1. (Previously Presented) A method for partitioning a pattern into optimized sub-patterns,
2 the method comprising:
3 providing a list of features of the pattern;
4 generating a set of candidate partitions using the list of features of the pattern;
5 scoring each candidate partition of the set of candidate partitions by building sub-patterns
6 using the set of candidate partitions, wherein each candidate partition is scored using a scoring
7 function based on characteristics of a sub-pattern derived therefrom and wherein the
8 characteristics of the sub-pattern includes an overall "suitability" of the sub-pattern used as a
9 search pattern applied to the original pattern;
10 determining a best-scoring partition among the set of candidate partitions;
11 applying the best-scoring partition to the list of features so as to provide a plurality of
12 sub-lists of features respectively representing a plurality of optimized sub-patterns.

1 2. (Original) The method of claim 1, wherein providing a list of features includes:
2 using at least one sub-list from the plurality of sub-lists of features generated by an earlier
3 application of the method as the list of features of the pattern.

1 3. (Original) The method of claim 1, wherein providing a list of features of the pattern
2 includes:

3 providing an image; and
4 extracting a list of features from the image.

1 4. (Original) The method of claim 3, wherein extracting a list of features from the images
2 includes:
3 sampling the image so as to provide a regular array of pixels.

1 5. (Original) The method of claim 4, wherein extracting a list of features from the images
2 includes:
3 using an edge extraction method to provide an edge image; and
4 sampling the edge image to provide a plurality of edge feature points.

1 6. (Original) The method of claim 5, wherein each edge feature point includes the angle of
2 the edge at that edge feature point.

1 7. (Original) The method of claim 1, wherein features of the pattern are 2D image points.

1 8. (Original) The method of claim 1, wherein features of the pattern are points of any
2 dimensionality.

1 9. (Original) The method of claim 1, wherein providing a list of features includes:
2 providing an abstract pattern description; and

3 extracting a list of features from the abstract pattern description.

1 10. (Original) The method of claim 1, wherein providing a list of features includes:
2 providing a pre-generated list of features.

1 11. (Original) The method of claim 1, wherein generating a set of candidate partitions using
2 the list of features of the pattern includes:
3 using a clustering algorithm.

1 12. (Original) The method of claim 1, wherein generating a set of candidate partitions using
2 the list of features of the pattern includes:
3 using a spatial subdivision algorithm.

1 13. (Original) The method of claim 1, wherein generating a set of candidate partitions using
2 the list of features of the pattern includes:
3 using a method that yields sub-lists that include pattern features that span an area of the
4 pattern that is spatially small with respect to the area of the entire pattern.

1 14. (Original) The method of claim 1, wherein generating a set of candidate partitions using
2 the list of features of the pattern includes:
3 using a method that provides sub-lists having pattern features that are more near to each
4 other than to pattern features in other sub-lists.

1 15. (Original) The method of claim 1, wherein generating a set of candidate partitions using
2 the list of features of the pattern includes:

3 building a weighted graph using the list of features of the pattern; and
4 partitioning the weighted graph to generate candidate partitions.

1 16. (Original) The method of claim 15, wherein building a weighted graph using the list of
2 features of the pattern includes:

3 fully connecting the feature points to make a graph; and
4 setting the weights on each link.

1 17. (Original) The method of claim 15, wherein building a weighted graph using the list of
2 features of the pattern includes:

3 sparsely connecting the feature points to make a graph; and
4 setting the weights on each link.

1 18. (Original) The method of claim 16, wherein the weights on each link are based on the
2 distance between each pair of feature points.

1 19. (Original) The method of claim 18, wherein weights decrease as the distance between
2 feature points increases.

1 20. (Original) The method of claim 16, wherein the weights on each link are based on at
2 least one of similarity of angle and similarity of magnitude.

1 21. (Original) The method of claim 16, wherein the weights on each link are based on values
2 associated with the feature points of the pattern.

1 22. (Original) The method of claim 16, wherein the weights on each link are determined
2 such that:
3 larger weights represent a pair of features that tend to be together in the same sub-lists of
4 features; and
5 smaller weights indicate a pair of features that can be included in different sub-lists of
6 features.

1 23. (Original) The method of claim 15, wherein partitioning the weighted graph to generate
2 candidate partitions includes:
3 dividing the weighted graph into two sub-graphs, one of which may be empty; and
4 converting the two sub-graphs into two sub-lists of features.

1 24. (Original) The method of claim 15, wherein partitioning the weighted graph to generate
2 candidate partitions includes:
3 partitioning the weighted graph using a "normalized cut" method to generate candidate
4 partitions.

1 25. (Original) The method of claim 1, wherein in generating a set of candidate partitions
2 using the list of features of the pattern, at least one candidate partition has only a single sub-list
3 of features of the pattern.

1 26. (Original) The method of claim 1, wherein in generating a set of candidate partitions
2 using the list of features of the pattern, each candidate partition has many sub-lists of features of
3 the pattern.

1 27. (Original) The method of claim 1, wherein in generating a set of candidate partitions
2 using the list of features of the pattern, some features included in the list of features of the pattern
3 do not appear on any sub-list of features of the pattern.

1 28. (Original) The method of claim 1, wherein in generating a set of candidate partitions
2 using the list of features of the pattern, at least one feature of the pattern appears on a plurality of
3 sub-lists of features of the pattern.

1 29. (Cancelled)

1 30. (Previously Presented) The method of claim 1, wherein characteristics of the sub-pattern
2 includes:
3 spatial coherence of the features corresponding to the sub-pattern.

1 31. (Previously Presented) The method of claim 1, wherein characteristics of the sub-pattern
2 includes:
3 overall spatial size of the area spanned by the feature points corresponding to the sub-
4 pattern.

1 32. (Original) The method of claim 31, wherein the area spanned by the feature points is
2 represented by the smallest bounding box that includes all the feature points.

1 33. (Previously Presented) The method of claim 1, wherein characteristics of the sub-pattern
2 includes:
3 the number of feature points in the sub-pattern.

1 34. (Previously Presented) The method of claim 1, wherein characteristics of the sub-pattern
2 includes:
3 the total amount of weight in links "cut" by the partition algorithm to create the sub-
4 pattern.

1 35. (Cancelled)

1 36. (Previously Presented) The method of claim 1, wherein characteristics of the sub-pattern
2 includes:

3 spatial coherence of the features corresponding to the sub-pattern;
4 overall spatial size of the area spanned by the feature points corresponding to the sub-
5 pattern;
6 the number of feature points in the sub-pattern;
7 the total amount of weight in links "cut" by the partition algorithm to create the sub-
8 pattern; and
9 the overall "suitability" of the sub-pattern used as a search pattern applied to the original
10 pattern.

1 37. (Previously Presented) The method of claim 1, wherein the overall "suitability" of the
2 sub-pattern used as a search pattern applied to the original pattern depends on:
3 the search algorithm used.

1 38. (Previously Presented) The method of claim 1, wherein the overall "suitability" of the
2 sub-pattern used as a search pattern applied to the original pattern depends on:
3 degeneracy of the features of a sub-pattern.

1 39. (Original) The method of claim 1, wherein the overall "suitability" of the sub-pattern
2 used as a search pattern applied to the original pattern depends on:
3 redundancy of the sub-pattern within the original pattern.

1 40. (Original) The method of claim 1, wherein determining a best-scoring partition among
2 the set of candidate partitions includes:
3 using a partition score threshold.

1 41. (Original) The method of claim 40, wherein the partition score threshold is settable.

1 42. (Original) The method of claim 40, wherein the partition score threshold is
2 predetermined.

1 43. (Original) The method of claim 40, wherein the partition score threshold includes a
2 portion that is predetermined, and a portion that is settable.

1 44. (Original) The method of claim 40, wherein if no candidate partition has a score above
2 the partition score threshold, then the list of features of the candidate partition is deemed to be
3 one that cannot be usefully sub-divided.

1 45. (Cancelled)

1 46. (Previously Presented) A method for dividing a pattern into a plurality of sub-patterns,
2 each sub-pattern being adapted for use with an image search method that can provide a plurality
3 of sub-pattern search results, the method comprising:
4 representing the pattern as a plurality of feature points;

5 generating candidate partitions of the plurality of feature points;
6 scoring the candidate partitions by examining characteristics of each potential sub-pattern
7 of each candidate partition, wherein each candidate partition is scored using a scoring function
8 based on characteristics of a sub-pattern derived therefrom and wherein the characteristics of the
9 sub-pattern includes an overall "suitability" of the sub-pattern used as a search pattern applied to
10 the original pattern;
11 selecting the highest-scoring partition;
12 applying it to the plurality of feature points so as to create one or more sub-pluralities of
13 feature points.

1 47. (Original) The method of claim 46, wherein the sub-pluralities of feature points are used
2 as sub-patterns by an image search method that is adapted to use pluralities of feature points.

1 48. (Original) The method of claim 46, wherein the characteristics of each potential sub-
2 pattern of each candidate partition include:
3 area, number of feature points, and suitability of the sub-pattern for use with a particular
4 search method.